REMARKS

Present Status of the Application

Claims 1-5, 7-16, and 18-23 are pending of which claim 10 has been amended and a new claim 23 has been added to more clearly describe the claimed invention. It is believed that no new matter adds by way of amendments made to specification or otherwise to the application. For at least the foregoing reason, Applicants respectfully submit that claims 1-5, 7-16 and 18-23 patently define over prior art of record and reconsideration of this application is respectfully requested.

Discussion of the claim rejection under 35 USC 112

1. The Office Action rejected claims 1-5, 7-16 and 18-22 under 35 U.S.C. 112, first paragraph, as failing to comply with written description requirement. The claims contain subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

In rejecting the above claims, the Office Action stated that claims require that the polysilicon is formed with greater grain size due to lower thermal conductivity of the porous material layer. The scope of these claims is vague, as it is not known what the grain size need to be greater than and what the thermal conductivity need to be lower than in order to satisfy the limitations of the claims. The description fails to make light of this issue, and thus the claims fail to comply with the written description.

Applicants respectfully disagree and would like to point out that paragraph [0008] clearly describes that conventionally, the stress buffer layer 102b that is in contact with the amorphous silicon layer 104 is usually a chemically vapor deposited silicon oxide layer, wherein its film structure is denser and its thermal conductivity is about 0.014 W/cm-K (20 degrees Celsius). In the conventional excimer laser annealing process, the thermal conductivity of the stress buffer layer directly affects the grain size of the polysilicon layer. If the thermal conductivity of the stress buffer layer is lower, the polysilicon layer can form with a larger grain size. Therefore, during the excimer thermal annealing process, the thermal conductivity of the film

layer that is in contact with the amorphous silicon layer, for example, the stress buffer layer, needs to be lower further to grow a polysilicon layer with a larger grain size.

Therefore, with regard to the size of the crystals, it would be understood by one skilled in the art that by using a thermal stress buffer layer 102b having a thermal conductivity lower than 0.014 W/cm-K (at 20 degrees Celsius) in contact with the amorphous silicon layer, a polysilicon layer with larger grain size can be obtained compared to that when the amorphous silicon layer in contact with silicon nitride layer as described in the admitted prior art.

Furthermore, with regard to the thermal conductivity of the porous material, at paragraph [0026], it is clearly described that the thermal conductivity is lower than 0.014 W/cm-K (at 20 degrees Celsius).

Furthermore, Applicants respectfully submit that the limitations with respect to grain size is not recited within the claims and whereas, the limitations of thermal conductivity of the porous material is recited in claims 8 and 19, which requires to be lower than 0.014W/cm-K (20 degrees Celsius).

Accordingly, Applicants respectfully submit the claims do comply with written description and that the rejections thereof by the Examiner are due to an error. Reconsideration of these claims is respectfully requested.

2. The Office Action rejected claims 1-5, 7-16 and 18-22 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicants respectfully disagree and would like to point out the limitations with respect to grain size is not recited with the claims and whereas, the limitations of thermal conductivity of the porous material is recited in claims 8 and 19, which requires to be lower than 0.014W/cm-K (20 degrees Celsius).

Accordingly, Applicants respectfully submit that the rejections of claims 1-5, 7-16 and 18-22 by the Examiner are due to an error. Reconsideration of these claims is respectfully requested.

Discussion of the claim rejection under 35 USC 103

1. The Office Action rejected claims 1-3, 5, 7-14, 16 and 18-22 under 35 USC 103(a) as over the Applicant's Admitted Prior Art (hereinafter AAPA) in view of Kanaya et al. (US-6,025,217, hereinafter Kanaya) and Havemann et al. (US-5,747,880, hereinafter Havemann), and further in view of Campion et al. (US-6,201,917, hereinafter Campion).

Applicants respectfully disagree and traverse the above rejections as follows. Independent claims 1 and 10 are allowable for at least the reason that AAPA, Kanaya, Havemann and Campion fail to teach, suggest or disclose each and every features of the claimed invention. More specifically, AAPA, Kanaya, Havemann and Campion fail to teach, suggest or disclose a method of forming polysilicon layer comprising at least a step of "forming a porous material layer on the barrier layer, wherein the porous material layer comprises an alloy of silicon oxide and aluminum oxide, and the barrier layer and the porous material layer form a buffer layer" as required by the

proposed independent claims 1 and 10. The advantage of forming a porous material a reliable structure of the porous material layer can be obtained and thus the reliability of the semiconductor device can be effectively enhanced.

The Examiner states, on page 5, lines 11-19, the AAPA, Kanaya, Havemann and Campion fail to teach aluminum oxide being included in the porous layer. However, the Examiner stated that Havemann teaches that the porous oxide has less mechanical strength than solid oxide and there exist a need to strengthen the porous silicon oxide layer, and relied upon Campion that Campion teaches increasing the strength of the silicon oxide by doping it with aluminum oxide in the range of 100 ppm to 1000 ppm. Therefore, it would have been obvious at the time of the invention was made to a person having ordinary skill in the art to dope the porous silicon oxide layer with aluminum oxide in the amount taught by Campion.

Applicants respectfully disagree and would like to point out that it is well known in the art that the term "alloy" indicates that the alloy material is composed of substantially homogenous mixture of two or more metals. Accordingly, by doping the porous silicon oxide layer with aluminum oxide, as taught by Campion, cannot possibly produce an alloy material of silicon oxide and aluminum oxide. Accordingly, Applicants respectfully submit that Campion cannot possibly meet the claimed invention in this regard.

In other words, even when teachings of AAPA, Kanaya, Haveman and Campion are combined in a manner suggested by the Office Action, the combined teachings at best would lead to the formation of a porous silicon oxide layer doped with aluminum

oxide and not a porous material layer composed of alloy of silicon oxide and the aluminum oxide as required by the proposed independent claims 1 and 10.

Furthermore, Applicants respectfully submit a new proposed independent claim 23 reciting feature similar to the proposed independent claims 1 and 10, and also specifies a ratio of the silicon oxide to the aluminum oxide in the porous material layer is about 95:5. Accordingly, Applicants similarly submit that the new proposed independent claim 23 also patently define over the prior art of record for at least the same reasons discussed above.

Accordingly, Applicants respectfully submit that AAPA, Kanaya, Havemann and Campion neither alone nor in combination can possibly render every feature of the proposed amended claims 1, 10 and 23 in this regard, and therefore claims 1, 10 and 23 should be allowed.

For at least the above reasons, it is therefore submitted that claims 1-3, 5, 7-14, 16 and 18-23 patently define over AAPA, Kanaya, Havemann and Campion. Reconsideration and withdrawal of these rejections is respectfully requested.

2. The Office Action rejected claims 4 and 15 under 35 USC 103(a) as being unpatentable over AAPA in view of Kanaya, Havemann and Campion as applied to claims 1 and 10 above, and further in view of Haven et al. (US-6,380,670, hereinafter Haven).

Applicants respectfully disagree and would like to point out that even though the Office Action relied upon Haven to disclose an e-beam evaporation, still the

Haven cannot possibly cure the specific deficiencies of AAPA, Kanaya, Havemann and Campion as discussed above. Furthermore, the Haven is not related to crystallization. Accordingly, Claims 4 and 15 also patently define over prior arts of record for at least the same reasons as well. Reconsideration and withdrawal of these rejections is respectfully requested.

3. The Office Action rejected claims 1-3, 5, 7-14 and 18-22 under 35 USC 103(a) as being unpatentable over AAPA in view of Kanaya and Numata et al. (US-6,380,670, hereinafter Haven), and further in view of Campion.

Applicants, as substantially discussed above, similarly submit that AAPA, Kanaya, Numata and Campion fail to teach, suggest or disclose "forming a porous material layer on the barrier layer, wherein the porous material layer comprises an alloy of silicon oxide and aluminum oxide" as required by the amended proposed independent claims 1, 10 and 23. Accordingly, Applicants respectfully submit claims 1-3, 5, 7-14 and 18-23 patently define over AAPA, Kanaya, Numata and Campion, and therefore, claims 1-3, 5, 8-14 and 19-23 should be allowed. Reconsideration and withdrawal of these rejections is respectfully requested.

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CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims 1-5, 7-16 and 18-23 of the present application patently define over the prior art and are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted

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